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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/509,328
Filing Date: October 07, 2004
Appellant(s): SCHMITT ET AL.

Stefan U. Koschmieder
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 24, 2007
appealing from the Office action mailed January 25, 2007.

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(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The differences are as follows: Claims 1-11, 21-23 27-29, 33, and 35 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the

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alternative, under 35 U.S.C. 103(a) as obvious over Smith et al. (US-571).

(7) Claims Appendix

A substantially correct copy of appealed claim 1 appears on page 12 of the Appendix to the appellant's brief. The minor errors are as follows: Firstly, there is a methyl group pendant on the terminal unsaturation in formula (I). Secondly, there is a parenthesis in the middle of formula (II), containing a subscript x. These structural features were absent during the history of the prosecution, as well as in appellants' disclosure.

(8) Evidence Relied Upon

US 5,384,379	Bader et al.	01-1995
US 6,342,571 B1	Smith et al.	01-2002
FR 2 771 411 A1	Elf Atochem Inc.	05-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

(I) Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bader et al. (US-379) in view of FR 2 771 411 A1 (with respect to claim 8).

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US 5,384,379 to Bader et al. discloses a method of making sulfur-containing poly(meth)acrylate, derived from free radical polymerization of sulfur-containing (meth)acrylate monomers set forth in formulas (I) and (II), in a molar ratio ranges 1:0.5 to 0.5:1, in the presence of inert organic solvent L at 40-90°C. Prior art monomers (I) and (II) fall within the scope of the instant (I) and (II) compounds. Specifically, the subscript n in prior art (II) has a value of 1-6, which meets the instant requirement of $m+n > 0$ and $m+n=2$. Prior art sulfur-containing monomers is derived from the reaction product of (III) and (IV) as presently claimed (col. 2, lines 10-68). The admixture of compound (III) in inert organic solvent L and compound (IV) in aqueous alkaline solution is introduced into the reaction vessel to form product V, corresponding to the instant monomer mixtures (I) and (II), prior to their polymerization at 40-90°C as expressed in claim 7 (col. 3, lines 4-47; col. 4, lines 3-5). Patentees' preferred (III) and polythiol (IV) include (meth)acrylic anhydride, and 1,2-ethanedithiol, respectively, as expressed in claims 3-4 (col. 3, lines 4-5, line 49). Prior art essentially employ identical process conditions as presently claimed, with the slight difference in number mole of (III) employed.

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Patentees use at least two moles of (III) to react with one mole of (IV), whereas appellants use one to less than two moles of (III) to react with one mole of (IV). The examiner is of the position that when the claimed range and the prior art range are very similar (i.e. less than two vs. two), the range of the prior art establishes prima facie obviousness because one of ordinary skill in the art would have expected the closely similar ranges to have the same or essentially the same properties. US-379 is silent regarding the use of an acidic ion exchanger as expressed in claim 8. The employment of such, is expressly taught in FR-411 in a closely analogous process of making dithioester as defined in the instant (I) derived from (III) and (IV). Accordingly, one of ordinary skill in the art would readily envisage using the acidic ion exchanger catalyst expressly taught in FR-411 in the process of US-379, motivated by the reasonable expectation of success of minimizing the occurrence of post-reaction treatment required in conventional processes.

(II) Claims 1-11, 21-23 27-29, 33, and 35 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Smith et al. (US-571).

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US 6,342,571 to Smith et al. discloses a process of producing a high refractive index optical resin composition, derived from polymerizing composition containing, inter alia, a mixture of thio(meth)acrylate functional monomers comprising (a)(i) (i.e. formula I) and (a)(ii) (i.e. formula II), first and second thio(meth)acrylate functional monomers within the scope of the instant compounds (I) and (II), respectively. The instant mixture (I) and (II), containing more than 10 mol% of compound (II), produced by reacting (III) and (IV) recited in a product-by-process format appears to be identical to prior art thio(meth)acrylate mixture (a)(i) (i.e. formula I) and (a)(ii) (i.e. formula II), produced by reacting a (meth)acryloyl chloride or (meth)acrylic anhydride (B) with a polythiol (i.e. 1,2-ethanedithiol) (A), in a molar ratio of (B) to (A) from 1.3:1 to 2.5:1, within the scope of the instant ratio (col. 5, lines 9-62). The examiner is of the position that appellants' compound (II) and the (a)(ii) thio(meth)acrylate (i.e. formula II) of the prior art appear to be identical or substantially identical. Prior art process entails slowly admixing an aqueous solution of 1,2-ethylenedithiol disodium salt with methacrylic anhydride in a suitable solvent under inert

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conditions (col. 5, lines 28-45). Smith et al. specifically teaches controlling the relative amounts of monomers (a)(i) and (a)(ii) by selecting the suitable molar ratios of (B) and (A) used in the reacting process. The preferred polythiol used (i.e. corresponding to the instant (IV)) include 1,2-ethanedithiol as expressed in claim 4 (col. 4, line 61; col. 5, line 7). The resultant polymerizates obtained by prior art process is a transparent solid with optical utilities, having a refractive index of at least 1.57 and an Abbe number of at least 35 (col. 13, lines 36-49), within the scope of the instant properties expressed in claims 27-28, and 33. A casting composition comprising solely of thio(meth)acrylate mixture (a)(i) and (a)(ii) was exemplified in Example 1 (see col. 16, Tables 1 and 2). Accordingly, the examiner is of the position that prior art polymerized product, which appear to be identical or substantially identical to appellants' polymerized product, would necessarily or inherently possess the relied upon optical characteristics/properties of appellants' claimed product. The burden is upon the appellants to provide clear evidence that the respective thio(meth)acrylate monomer mixtures and the resultant polymerizates do in fact differ.

(10) Response to Argument

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Appellants' argument set forth in the appeal brief have been fully considered but are not found to be persuasive for at least the following reasons.

In item (A) of appellants' argument, appellants urge that the at least 2.0 mol of (III) in the prior art (Bader et al.) does not establishes prima facie obviousness the claimed upper limit of less than 2.0 mol of (III). The examiner respectfully disagrees, and is of the position that the at least 2.0 mol in Bader et al. is not distinguishable experimentally, taken into consideration of experimental standard deviations, from appellants' less than 2.0 mol. For example, appellants have not shown using 1.9997 mol of (III) as presently claimed, would produce a different product (II) as compared to using 2.0000 mol of (III) as taught in the prior art. It is well established that a prima facie case of obviousness exists where the claimed range and the prior art range, though not overlapping, are sufficiently close that one having ordinary skill in the art would have expected the product to have the same or very similar properties. See, e.g., *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578, 16USPQ2d 1934, 1936-37 (Fed. Cir. 1990). This applies to the 1.8,

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1.6, or 1.5 mol expressed in claims 21-23, in the absence of clear and convincing evidence of criticality or unexpected results demonstrated for the scope of the claimed molar ratios.

Appellants further urge in items (C) and (D) that the office failed to give consideration to appellant's factual evidence and the office's objections to the data provided in support of patentability are technically unreasonable. The examiner respectfully disagrees. Appellants' comparative data (see Tables 1, 2, and 3 on page 30 of the specification) have been fully considered during the prosecution. The comparative evidence presented is not clear and convincing with respect to criticality of molar ratios of (III) and (IV). The comparative showings of record are not conducted in a side-by-side manner with fixed variables (i.e. reaction solvent, mol of NaOH used, reaction time and temperature, the absence or presence of protective gas, relative mol% of EDTDMA (I) used to make the polymer, etc.), and the many unfixed variables contained therein could lead to an inconsistent experimental outcome. In the absence of side-by-side comparison with fixed variables, it is unclear where the unexpected results lie in applicants' process, as compared

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to prior art process. The differences in refractive index may due to variations in reaction conditions, rather than due to using a mol ratio of less than 2.0 of (III) to 1.0 mol of (IV) as asserted by appellants. For example, in the initial process of forming compound (II) via reaction of compounds (III) and (IV); inventive samples B1-B4 is conducted at 25-30 °C, whereas comparative VB1-VB3 is conducted at 15-20 °C (see pages 27-29); VB1 and VB3 used 2.3 mol of NaOH, VB2 uses 1.5 mol of NaOH, whereas B1-B4 used 1.692-1.760 mol NaOH. Furthermore, different solvents are used in the respective examples (see Table 1 on page 30). In the polymerization process (see Table 2 on page 30), the metering temperatures, the reaction conditions (i.e. time and temperature, absence or presence of protective gas), and the concentration of EDTDMA (i.e. compound (I)) are different between VB1-VB3 and B1-B4, without fixed variable for side-by-side comparison. The examiner further queries as to why VB2 is a prior art comparison since it uses 1.52 mol of MAA (i.e. (III)) within the inventive scope. Still further, the relied upon differences in the degree of polymerization and/or relative mol% of mono-, di-, and tri- adducts formed by reacting the

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compounds (III) and (IV) stated in appellants' arguments are not recited in the present claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. It is well established that to overcome a reasonable case of prima facie obviousness, appellants' comparative showing must be clear and convincing, and a given claim must be commensurate in scope with any showing of unexpected results. Finally, while the ingredients mentioned (i.e. solvent, NaOH, EDTMA, etc.) may not be present in compound (II) as appellants argued, their variable presence during the reactions, along with the differences in experimental conditions (i.e. temperature, time, etc) may yield different products with different properties. Accordingly, the examiner's position is maintained.

Regarding item (D) in appellants' argument, appellants urge that the mixtures of monomers in Smith et al. is different than the instant compound (II), which is an oligomer. The examiner respectfully disagrees. The second thiol(meth)acrylate monomer (II) in Smith et al. can be oligomeric because the subscript u is defined as an integer from 1-10 (col. 3, lines 1-14). For example, when $u=2$, the instant (II) with $m=2$, $n=0$, $m+n>0$, and $m+n=2$ requirements

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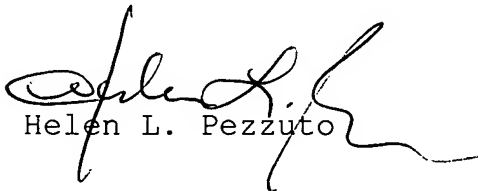
is met. Thus, a mixture of Smith monomers (a)(i) and (a)(ii) are within the scope of the instant mixture of compounds (I) and (II), and the polymerization of the monomer mixture would be expected to result in identical or substantially identical transparent plastic, having the identical or substantially identical properties, absent rebuttal evidence of the contrary.

(11) Related Proceeding(s) Appendix



No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


Helen L. Pezzuto

Conferees:

 
David Wu, James Seidleck